

REMARKS

Claims 1-3, 5-17, and 36-46 are pending.

The Examiner rejected Claims 7, 8, and 12-16 under 35 U.S.C. 112, first paragraph. Specifically, the Examiner objected to language in claims 7 and 12 that stated the device further comprised a dielectric fixation layer, which added a second fixation layer to the device in addition to the fixation layer in amended claim 1. Claims 7 and 12-16 are amended to clarify that the fixation layer referred to in these claims is the same fixation layer recited in claim 1. Applicants respectfully submit that all claims meet the requirements of 35 U.S.C. 112.

Claim 12 is amended to recite "said fixation layer serving as a diffusion barrier." The Advisory Action mailed November 20, 2002 states "the fixation layer is not the same as the diffusion barrier and the amended claims are not consistent. Also, compare with the specification." Applicants respectfully submit that claim 12 is consistent with the specification. The specification states at page 6, lines 23-25:

In one embodiment, the fixation layer is a metal layer that covers the entire silver layer and acts as a passivation layer that prevents the diffusion of the metal from the bonding layer into the silver layer. (Emphasis added).

On page 7, lines 20-21, the specification states:

The diffusion barrier layer also functions as a metal fixation layer that improves the mechanical and electrical characteristics of the underlying silver layer. (Emphasis added).

Both passages quoted above refer to the same layer, layer 102 in Figure 2.

Accordingly, it is clear from the specification that in some embodiments, the fixation layer functions as a diffusion barrier. The diffusion barrier is not an additional layer in these embodiments. Accordingly, Applicants respectfully submit that the claims as amended are supported by the specification.

The specification further states at page 6, line 21 that “the fixation layer can be a metal or a dielectric. Claims 5, 6, and 12-16 are directed to devices with metal fixation layers. Claim 12 recites that the “fixation layer is disposed between said bonding layer and said layer of silver.” Accordingly, the metal fixation layer of claim 12 forms an electrical path between the bonding layer and the layer of silver. Claims 7, 8 and 37 are directed to devices with dielectric fixation layers. Claim 37 recites “the bonding layer is disposed on a first portion of the silver and the fixation layer is disposed on a second portion of the silver.” Accordingly, the dielectric fixation layer of claim 37 does not interfere with the electrical path between the bonding layer and the layer of silver. Thus, all claims are consistent with the teachings of the specification.

In view of the above arguments, Applicants respectfully request allowance of all pending claims. Should the Examiner have any questions, the Examiner is invited to call the undersigned at (408) 382-0480.

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Respectfully submitted,



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ATTACHMENT A

IN THE CLAIMS

The claims are amended as follows.

1. (Twice Amended) A light emitting device comprising:
 - a substrate;
 - an n-type semiconductor layer;
 - an active layer for generating light, said active layer being in electrical contact with said n-type semiconducting layer;
 - a p-type semiconductor layer in electrical contact with said active layer; and
 - a p-electrode in electrical contact with said p-type semiconductor layer, said p-electrode comprising:
 - at least a layer of silver having a thickness sufficient to reflect greater than 50% of light incident thereon, wherein a portion of said generated light exits said device through said substrate after being reflected from said p-electrode[, and wherein said p-electrode further comprises];
 - a bonding layer in electrical contact with said layer of silver for making electrical connections to said layer of silver; and
 - a fixation layer overlying [and in electrical contact with] at least a portion of said layer of silver.
7. (Amended) The light emitting device of Claim 1 wherein said [p-electrode further comprises a dielectric] fixation layer [overlying said layer of silver] comprises a dielectric.
12. (Amended) The light emitting device of Claim 1 wherein said [p-electrode further comprises a diffusion barrier] fixation layer is disposed between said bonding layer and said layer of silver, said [diffusion barrier] fixation layer providing an electrical path between said bonding layer and said layer of silver, said fixation layer serving as a diffusion barrier layer for preventing constituents from said bonding layer from interdiffusing with said layer of silver.

13. (Amended) The light emitting device of Claim 12 wherein said [diffusion barrier] fixation layer comprises a metal.

14. (Amended) The light emitting device of Claim 13 wherein said [diffusion barrier] fixation layer comprises nickel.

15. (Amended) The light emitting device of Claim 12 wherein said [diffusion barrier] fixation layer encapsulates said layer of silver.

16. (Amended) The light emitting device of Claim 12 wherein said [diffusion barrier] fixation layer is a multi-layered structure.

36. (Twice Amended) A light emitting device comprising:
a substrate;
an n-type semiconductor layer;
an active layer for generating light, said active layer being in electrical contact with said n-type semiconducting layer;
a p-type semiconductor layer in electrical contact with said active layer; and
a p-electrode in electrical contact with said p-type semiconductor layer, said p-electrode comprising:
at least a substantially transparent layer of silver[, and wherein said p-electrode further comprises];
a bonding layer in electrical contact with said layer of silver for making electrical connections to said layer of silver; and
a fixation layer overlying [and in electrical contact with] said layer of silver.

Please add the following new claim:

37. (New) The light emitting device of Claim 7 wherein the bonding layer is disposed on a first portion of the silver and the fixation layer is disposed on a second portion of the silver.

38. (New) A light emitting device comprising:

- a stack of semiconductor layers including a light emitting region;
a metal electrode contacting a surface of the stack; and
a barrier overlying the metal electrode for preventing migration of metal from the metal electrode.

39. (New) The light emitting device of Claim 38 wherein the metal electrode comprises silver.

40. (New) The light emitting device of Claim 38 wherein the stack comprises a p-type III-nitride layer and the metal electrode is deposited on the p-type III-nitride layer.

41. (New) The light emitting device of Claim 38 wherein the barrier contacts a surface of the stack.

42. (New) The light emitting device of Claim 38 wherein the barrier surrounds a portion of the metal electrode not covered by the barrier.

43. (New) The light emitting device of Claim 38 wherein the barrier covers an edge of the metal electrode.

44. (New) The light emitting device of Claim 38 wherein the barrier covers an entire surface of the metal electrode not in contact with the stack.

45. (New) The light emitting device of Claim 38 wherein the barrier comprises a metal.

46. (New) The light emitting device of Claim 38 wherein the barrier comprises nickel.